

Renewables Deals

2012 outlook and 2011 review

*Mergers and acquisitions
activity in renewable
power and related clean
technology*



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Methodology and terminology

Renewables Deals includes analysis of global renewable energy and clean technology M&A deal activity. We define renewable energy deals as those relating to the following sectors: biofuels, biomass, geothermal, hydro, marine, solar and wind. Renewable energy deals relate to the acquisition of (i) operating and construction-stage projects involved in the production of renewable energy and (ii) companies manufacturing equipment for the renewables sector. We define clean technology deals as those relating to the acquisition of companies developing energy efficient products for renewable energy infrastructure. We exclude deals relating to nuclear power assets and deals where only a minority of the business's activity is in renewables. This year, the analysis is based on transactions from Clean Energy pipeline's proprietary M&A database, provided by Venture Business Research. This covers both 2010 and 2011 data in this year's edition. Other database providers have been used in some earlier years.

The main dataset in the report covers completed M&A deals only, and excludes Initial Public Offerings (IPOs) and deals which are pending for regulatory, legal or financial reasons. A selection of top pending deals and top IPOs is included separately in the report. The Asia Pacific region is deemed to include Australasia, except if otherwise explicitly stated. Deal values are stated as the consideration value announced or reported including any assumption of debt and liabilities. Figures relate to the actual stake purchased and are not grossed up to 100%. The analysis also includes deals with undisclosed value. Deals where the transaction value is undisclosed are assigned an average transaction value using a methodology derived from Clean Energy pipeline's proprietary M&A data. Comparative data for prior years may differ to that appearing in previous editions of our annual analysis or other current year deals publications. This can arise in the case of updated information, different methodological bases or methodological refinements and consequent restatement of the input database.

Introduction

Welcome to Renewables Deals, PwC's annual look at dealmaking in the renewable energy and related clean technology sectors. We publish our outlook on the prospects for dealmaking in the year ahead. We also take a look at what's been happening in the last 12 months and in the different main markets around the world.

The report is the fourth in our series on renewables. In our companion report, *Power Deals*, we separately look at the trends and dynamics in the wider power utilities and non-renewables generation sector. Together the two reports provide a comprehensive global analysis of M&A activity across the power and gas utilities sector.

This year, for the first time, we open our report with our discussion of the outlook for the year ahead and identify some of the main themes we expect to be at work. In our last report, we correctly forecast that 2011 would prove a busy year for renewables deals.

We also highlighted the step up in interest of Japanese and Chinese buyers which manifested itself in a number of significant recent deals.

Looking ahead, the sector is undergoing a growing maturity and consolidation phase. This evolution inclines us to believe that deal flow will remain significant in 2012. In part, though, this will depend on how the eurozone crisis unfolds. We assume a continuation of a 'rolling uncertainty' scenario affecting the eurozone and wider world sentiment. But, if there are significant adverse events that turn eurozone 'rolling uncertainty' into deeper crisis, deal flow is likely to be dampened.



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Report highlights

Renewables deals reach record values

Despite an uncertain general economic and market background, the value of renewables dealmaking has reached the highest level recorded in our report series. Total deal value was up 40% year on year – from US\$38.2bn in 2010 to US\$53.5bn in 2011.

'New generation' technologies enter the big time

Historically, hydro has dominated renewable deal flow. But we've now entered an era of US\$1bn plus deals in the 'new renewables' and energy efficiency sectors. Big deals are becoming more common in the wind, solar, biomass and energy efficiency fields. For the first time ever, US\$1bn plus deals in these four sectors dominate the list of top deals, outnumbering hydro by seven to one as contributors to big deal flow.



Sun shines on solar and energy efficiency deal activity

As we predicted in last year's report, we are seeing particularly strong momentum behind deal activity in the solar and energy efficiency sectors. Buoyed by the increase in big transactions, deal value in these two sectors has nearly doubled year on year. Together, they account for the vast majority (79%) of the US\$15.3bn increase in the total value of all renewables deals.

Industry change is driving deal momentum

A number of themes are characterising deal activity, reflecting significant change in the industry. With growth, the renewable energy sector is undergoing a period of shake-out and consolidation. The ultimate result is likely to be a succession of tie-ups within and between the main manufacturing territories of the US, Germany and China leading to a smaller number of big global players in both the wind and solar power markets.

Deal trends follow different cross-Atlantic directions

North American and Europe moved in different directions. Total target renewables deal value rose 80% in Europe, from US\$16.7bn to US\$30bn year on year, but it fell 5% in North America. Although two big deals saw North American solar deal value more than double, total M&A for windpower targets was down 35%. Low gas prices and continued uncertainty over tax credits and other support mechanisms are creating uncertainty in the US.

2012 deal outlook: growing sector maturity

Dealmaking in the renewables and energy efficiency sectors is intensifying as the sector evolves. Sustained high deal numbers and record total value reflect a maturing of the sector. The trend is all the more noteworthy given an uncertain market background and concerns over government policies on renewables.

In Europe, the economic and sovereign debt climate is pushing affordability to the front of the energy policy agenda. Concerns about end-customer prices and public finance constraints have led governments to revisit renewable energy subsidies and wider market frameworks. Downward revisions of subsidies in the solar sector by a number of governments have caused disquiet. In the US, time-limited windows for tax and other incentives continue to create uncertainty. In many markets, financing remains a concern as banks deleverage and debt markets tighten. On a global level, the prospect of a legally binding emissions reduction framework covering all countries has come back on the table but not until 2020 with the intervening path ahead remaining far from certain.

But, despite this background, deal activity has been strong in the renewable energy as well as the energy efficiency sectors. There are some distress factors at work but there is growing confidence in renewable generation gaining a more secure place in the energy mix. Thoughts are beginning to reach ahead to a time when government support can play a less critical role. This sentiment was reinforced by the policy reaction in many countries following the Fukushima nuclear emergency in Japan. The consequent reappraisal of nuclear energy has boosted the importance of renewable generation in many countries' energy strategies. Growing sector maturity is also heralding consolidation moves in solar which, alongside continued deal flow associated with windpower financing and development, are playing a significant part in deal activity.

A number of themes are influencing deal activity, reflecting change in the industry and, as the sector matures, we believe that deal flow will continue to be significant in the medium term. Actual 2012 activity will depend on how the eurozone crisis unfolds. We assume a continuation of a 'rolling uncertainty' scenario affecting the eurozone and wider world sentiment. But, if there are adverse events that turn eurozone 'rolling uncertainty' into deeper crisis, deal flow is likely to be dampened.

2011 review...

...Falling solar costs are coming from technology advances and economies of scale as well as competition. They are spurring growth, as solar photovoltaic (PV) generation becomes more economic and closer to grid parity in some conditions...

2012 view...

...With growth, the sector is undergoing a period of shake-out and consolidation. It is not just US and European manufacturers who are experiencing growing pains. Some Chinese manufacturers face heavy debt and are coming under competitive strain. There is significant overcapacity in China. The result is likely to be a succession of tie-ups within and between the main manufacturing territories of the US, Germany and China leading to a smaller number of big global players.

Solar growing pains

Many solar panel producers are facing the twin pincer of constrained financing options and falling prices as a result of competition from fast expanding Chinese manufacturers. The bankruptcy of US solar panel manufacturer Solyndra, a company that had been in the vanguard of the US government's green stimulus programme, was one of the most high profile examples of the squeeze facing part of the sector. Massachusetts-based Evergreen Solar also filed for bankruptcy. Elsewhere oil and gas giant BP exited the solar sector after 40 years of research and development. But the move was followed by a decision by India's Tata Power to buy out its 51% stake in their 22-year-old joint venture, Tata BP Solar. The size of the solar market in India is expected to grow to 800 to 1,200MW by 2014-15 and the country has an ambitious target of 20,000MW of solar power by 2022.

Nature's uncertainties make for choppy wind progress

Too much wind has caused development delays on important wind projects while too little wind has hit output projections on installed projects. The most high profile manifestation of this has been two profit warnings from Danish company Vestas but it is by no means alone in encountering difficulties. Wind volatility has also caused problems for the balancing of power systems. It is not just the vagaries of North Sea wind that are causing problems. Increased debt funding costs and subsidy changes are affecting project development. Predicting turbine demand in markets such as China is also proving difficult.

2011 review...

...Windpower growth is proving turbulent with a number of companies facing strains...

2012 view...

...In the same way that we expect to see a smaller number of global players in the solar market, consolidation among larger players is also likely to occur in the windpower sector. The scope for a major landmark combination between entities from one or more of Asia Pacific, Europe and North America exists and 2012 could be the year that it takes place. European company weakness is coinciding with a Chinese government move to limit the number of mainland turbine suppliers, causing a temporary slowing of projects in China and increasing the appetite of Chinese turbine manufacturers in overseas markets.

Asia Pacific bidders out in force

The strong encouragement given to renewable energy and other cleantech initiatives from China and some other Asia Pacific governments is reflected in a big increase in acquisition activity by Asia Pacific bidders. Such bidders were behind deals totalling US\$9.4bn in 2011 with an 18% share of worldwide renewables and cleantech bid activity, up from a 13% share in 2010. Japanese and Chinese bidders accounted for two of the three largest completed deals – Toshiba’s US\$2.3bn purchase of Landis+Gyr and China National Bluestar’s US\$2.2bn acquisition of Norwegian maker of solar-grade silicon Elkem (see figure 3, note 2). They were also active purchasers of smaller assets. The US\$1.7bn investment by Universal Resources in True Green Energy’s projects in the Philippines represents the interest of several Chinese entities. Elsewhere, Japanese and Chinese companies were active buyers of windfarm assets in the US, Australia and Europe (see regional sections).

Pension and insurance interest steps up

One of the recent landmark deals in the sector was the US\$1.1bn investment by Danish pension insurance groups PensionDanmark and PKA in a 50% stake of Dong Energy’s Anholt offshore windfarm project. It is the third time Dong has attracted an equity stake into a windpower project but it is notable for the size of the investment. It also comes at a time when other countries such as the UK are examining ways in which pension and insurance fund investment can be attracted to windpower investment, although the constitutional structure of how pension funds are managed in the UK remains an issue. Construction risk is a barrier to such investment. In the Danish case, the investment covered the construction cost but the risk remained with the developer.

Private equity involvement is changing

Renewables have become a significant hunting ground for private equity investors attracted by lower asset pricing in the sector. Increasingly such private equity investment is geared toward infrastructure-like investment returns rather than the traditional buy-out and sell-on approach. KKR, for example, highlighted the attraction of “core infrastructure assets providing stable and long-term cash flow visibility” in its announcement of a US\$464m investment with Munich Re for a 49% stake in Grupo T Solar, a company with extensive solar generation in Spain and Italy.

Energy affordability worries create a ‘trilemma’

Energy prices have become a hot issue in some European countries as the cost of decarbonisation bites and the economic situation puts pressure on customer budgets. Concerns about energy prices are creating a ‘trilemma’ in the triangle that has to be balanced between affordability, meeting carbon targets and security of supply, adding to the social pressures on governments. This increases the uncertainty faced by investors and dealmakers. Any weakening of the drive to meet the 2020 low carbon and renewable energy targets could disrupt investment assumptions.

2011 review...

...2011 saw the first Asian equity investment in UK offshore windpower with Marubeni Corporation taking a stake in Dong Energy’s Gunfleet Sands project...

2012 view...

...The deal was one of a number of moves by Asia Pacific buyers for western renewables and cleantech assets. We expect to see this activity strengthen with interest from acquirers from Korea and Singapore featuring alongside Chinese and Japanese bidders.

2011 review...

...Denmark is setting the pace for greater pension fund involvement in offshore windpower...

2012 view...

...We expect more countries and more deals to have pension and insurance fund involvement with investors, companies and governments finding ways to structure such investment to overcome the problem of construction risk. This risk itself will ease over time as offshore project experience develops but, even as the track record evolves, special structuring will be needed. The exact form of such arrangements, through for example green investment banks, is the subject of current policy discussion.

The eurozone crisis

Eurozone worries did not prevent a big rise in overall renewables deal value in 2010. But, worries about a further recession, constraints on financing and fears of a worst case collapse will inevitably cause dealmakers to continually reassess their options over the coming months. Some form of eurozone realignment remains a very real possibility. A climate of 'rolling uncertainty' looks set to continue through 2012 in the absence of sustained growth signals or strong leadership from policy makers. If economic growth signals turn positive, then 'rolling uncertainty' could transition into 'growing confidence'. However, further adverse events would be likely to cause strain in the renewables sector. Financing might become scarcer and worries about energy affordability (see page 8) could combine with stretched public financing to weaken policy support for the sector.

Perspective:

'Rolling uncertainty' – to deal or not to deal?

It's tempting to draw parallels between the crisis of 2008-9 and that of 2011-12. But there are important differences. The credit crunch had a definite focus, centred around the Lehman crash. The current crisis lacks an equivalent single 'big event focus' – a 'rear view mirror event' that can be seen as a turning point. Instead, there is ongoing material uncertainty with an accumulation of events. We've called it 'rolling uncertainty' in this report. This makes the deal environment much more difficult. The time horizon for an easing of debt issuance and bank finance remains uncertain. In addition, banks are assessing how the impact of new regulations such as Basel 3 will affect their own liquidity and capital ratios.

The advice in the first half of 2009 was 'if you don't have to be in the market, stay out of the market. Wait a few months until things improve and confidence and a sense of calm is restored. Then go with your deal.'

But that all assumes you have a 'rear view mirror event'. In 2012 there is no equivalent. Instead, there is great uncertainty about whether things will be better or worse in six months time. In this environment, perhaps paradoxically, a complete brake on dealmaking makes less sense. If a deal is highly strategic and mission critical, then parties may feel it is worth doing if it can get done on the right terms.

With the uncertainty over how long the constraints will persist, staying out of the markets just in the hope that things will improve cannot be assumed to be the right strategy.

Confidence about economic growth, the European banking system and the ability of governments to have a coordinated and convincing policy response are all critical if a more optimistic outlook is to emerge. On the political front, there are many potential minefields to be negotiated during 2012, both at the inter-governmental level and, domestically, between parties and with electorates. The potential for further destabilisation cannot be ruled out.

2011 deal review: a year of big deal flow

Renewables and energy efficiency deal value rose 40% year on year in 2011. The rise was fuelled by a big increase in US\$1bn plus deals. For the first time ever, US\$1bn plus deals dominate the list of the largest deals. And the list is almost all from a wave of solar, energy efficiency and windpower deals. The total number of 2011 deals dipped 6% year on year but remained high at 570, having rebounded in 2010 off the 2009 low of 319. Increased deal value is not just coming from the largest deals. Median deal value rose 25% year on year, from US\$28.1m to US\$35.2m.

In earlier years, deals for hydropower assets had boosted deal totals but these have dropped off in the last two years. Even the largest deal, the CPFL/ERSA merger, although classed as a hydro deal, is for a target that includes 30% windpower assets in its operational and pipeline portfolio. Rather than hydro, it is the 'new generation' of renewable power and energy efficiency technologies that are driving total values higher.

The solar and energy efficiency sectors together account for the vast majority (79%) of the US\$15.3bn increase in the total value of all renewables deals with the wind energy sector contributing most of the rest. Energy efficiency deal value was up 170% adding US\$6.4bn year on year, solar was up 56% with a rise of US\$5.7bn while windpower rose 23%, adding US\$2.9bn. Also for the first time ever, the number and value of solar deals moved above windpower deals. The 190 solar deals accounted for one in three of all renewables deals. They comfortably outnumbered the 169 windpower deals. The total solar deal value, at US\$15.8bn, edged above the US\$15.5bn windpower total.

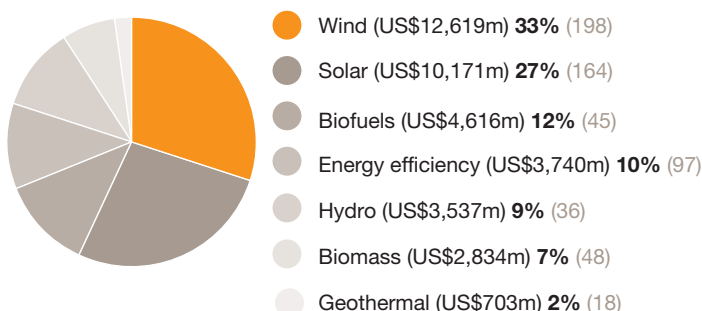
The top ten deals illustrate a number of important themes – utility companies seeking to scale up their renewable generation portfolios, smart grid technology acquisitions, Asia Pacific outbound investment, the growth of energy from biomass waste, and increased infrastructure, private equity and pension fund interest in the sector.

Figure 1: All renewables deals by value (US\$bn) and number of deals

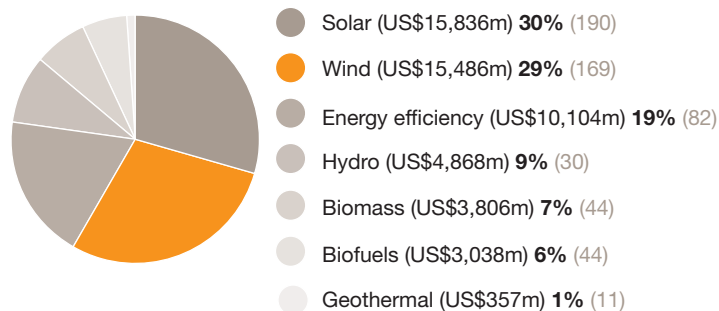
Number	2010 Value	Number	2011 Value	Change in 2011	
				% number	% value
606	US\$38.2bn	570	US\$53.5bn	(6%)	40%

Figure 2: Renewables deals total deal value and percentage share by sector (Deal numbers shown in parenthesis)

2010 (US\$38,221m)



2011 (US\$53,495m)



The biggest deal saw Brazilian utility CPFL Energia S.A. buy out renewable energy company ERSA Energias Renováveis in a US\$2.9bn move. The merged entity, CPFL Energias Renováveis, has 4,375MW of power operating, under construction or under preparation for construction, 45% of which is windpower, 36% biomass and 18% small scale hydroelectric. CPFL has 13% of the electricity market in Brazil. The ERSA merger follows its April 2011 acquisition of SL Jantus, owner of the country's largest windfarms.

Moves by utility companies were also a feature of some of the largest European renewables deals with the buy-backs by Iberdrola and EDF of the shares of their renewables arms that they had previously sold off.

Iberdrola's repurchase of a 20% stake in Iberdrola Renovables came at a time that allowed it to pay little more than half the price that it had been listed at four years earlier. The Iberdrola buy-back was followed by the Fukushima nuclear emergency and consequent reappraisal of nuclear's part in the energy mix by a number of governments (see figure 3, note 1).

The Fukushima emergency gave a boost to share prices in alternative energy companies ahead of EDF's April 2011 announcement that it was to buy back the 50% share of its alternative power subsidiary EDF Energies Nouvelles that it did not already own.

EDF is the world's largest listed nuclear energy producer and the deal forms an important foundation for achieving its 2020 ambition of generating 75% of its electricity output from CO2-free power generation fleet. It expects to increase its total installed capacity from 137GW in 2010 to 162GW in 2020 with the share of non-hydro renewable energy increasing from 2% to 9%, implying a more than fivefold increase in renewables. In the same period it anticipates nuclear's share reducing from 54% to 49%¹.

1 EDF, investor presentation, September 2011.

Figure 3: Top ten renewables deals announced and completed in 2011

No.	Value of transaction (US\$m)	Date announced	Target name	Target nation	Acquirer name	Acquirer nation	Market sector	Type of purchase
1	2,900	20 Apr 11	ERSA Energias Renováveis SA	Brazil	CPFL Energia SA	Brazil	Hydro	Operational
2	2,300	19 Jun 11	Landis+Gyr AG	Switzerland	Toshiba Corp. Innovation Network Corp. of Japan	Japan	Energy Efficiency	Technology
3	2,077	08 Apr 11	EDF Energies Nouvelles SA	France	Electricite de France SA	France	Wind	Operational
4	1,687	22 Nov 11	True Green Energy Group	Philippines	Universal Resources Development Inc.	USA	Biomass	Operational
5	1,370	03 May 11	SunPower Corp.	USA	Total SA	France	Solar	Technology
6	1,364	01 Jun 11	Telvent GIT SA	Spain	Schneider Electric SA	France	Energy Efficiency	Technology
7	1,230	08 Sep 11	Sarnia solar project (80MW), Enbridge Ontario wind project (190MW), Talbot wind project (99MW), located in Sarnia and Chatham, Canada.	Canada	Enbridge Income Fund	Canada	Solar	Operational
8	1,130	28 Mar 11	Windfarm (400MW) – Anholt	Denmark	PensionDanmark A/S PKA A/S	Denmark	Wind	Operational
9	880	12 Aug 11	Windfarms (443MW) – Castilla y Leon province Spain	Spain	Bridgepoint	Spain	Wind	Operational
10	731	22 Jul 11	Hansen Transmissions International NV	Belgium	ZFHN Zukunftsfonds Heilbronn GmbH & Co. KG	Germany	Wind	Technology

Note 1: Data in all other figures (except IPO figures) are based on all deals completed in 2011. In order to highlight the most recent deals, we have omitted from the above table two deals completed in 2011 but announced in the previous year – China National Bluestar's US\$2.2bn purchase of Elkem in Norway and Terra Firma Capital Partner's US\$0.9bn purchase of Rete Rinnovabile Sri in Italy.

Note 2: Iberdrola's US\$3.5bn share repurchase of Iberdrola Renovables deal was also announced and completed in 2011. It is classified as a share repurchase programme and, as such, not included in the data. The EDF buy-back is included as it is classified as a conventional M&A transaction, in which Societe Internationale d'Investissements Financiers and Paris Mouratoglou are selling their stake in the company.

Figure 4: Top five renewable deals announced in 2011 and pending at year-end

No.	Value of transaction (US\$m)	Date announced	Target name	Target nation	Acquirer name	Market sector
1	464	18 Jul 11	Solar plants (168MW) – Spain & Italy	Spain/Italy	KKR Kohlberg Kravis Roberts & Co. LP, Munich Re	Solar
2	403	23 Jun 11	Solar plants (80MW) – Italy	Italy	F2i Fondi Italiani per le Infrastrutture, Etrion Corp.	Solar
3	330	03 Nov 11	Windfarm (300MW) – Lac Alfred	Canada	Enbridge Inc.	Wind
4	272	29 Jun 11	Grupo Indal SL	Spain	Royal Philips Electronics N.V. (a.k.a. Koninklijke Philips Electronics NV)	Energy Efficiency
5	238	07 Nov 11	Windfarms (346MW) – China (China Longyuan Power Group Corp Ltd.), Biomass plants (144.2MW) – China (China Longyuan Power Group Corp Ltd.)	China	China Longyuan Power Group Corp Ltd.	Wind

Project finance: pre-construction private equity in offshore windpower

In Autumn 2011, Blackstone unveiled one of the biggest offshore project financings with investments totalling around US\$3.2bn in two German offshore projects. The investments in the Meerwind and Noerdlicher Grund windfarms came as the German government stepped up its commitment to renewable energy in the wake of its decision to phase out nuclear power following the Fukushima emergency. Meerwind is the largest German offshore windfarm to complete its full financing process and is the first to be fully funded by private investors. It is the first to close under the government's KfW offshore wind programme, designed to stimulate project funding. With 80 turbines and a 288MW capacity, it is expected to be completed in 2013.

Financial buyer interest surges

Deal interest in the sector from private equity and other types of financial buyers has surged. The number of such deals rose by 27% year on year in 2011 and the total value of financial buyer transactions rose 146%, from US\$4.8bn to US\$11.9bn (see figure 5). Attracted by low asset prices, private equity companies such as Bridgepoint and KKR have been very active buyers in the competition for renewables assets, alongside companies with long established renewables arms such as HG Capital and Platina Partners.

Infrastructure and other investment funds continue to be active investors in renewable energy. The largest such 2011 deal came with Canada's Enbridge Income Fund's US\$1.2bn purchase of 369MW of wind and solar generation assets from indirect wholly owned subsidiaries of Enbridge Inc. (see North America section). We look in detail at the remainder of the top deals in the regional chapters later in this report.

Figure 5: Renewables deals by acquirer type – 2010-2011

	2010				2011			
	Number	Value (US\$m)	% number	% value	Number	Value (US\$m)	% number	% value
Alternative energy	84	8,148	42%	28%	71	6,899	36%	16%
Diversified	23	5,045	12%	17%	24	9,040	12%	21%
*Financial	41	4,828	21%	17%	52	11,869	26%	28%
Other	24	4,461	12%	15%	30	7,188	15%	17%
Utility	28	6,509	14%	22%	23	7,629	12%	18%
Total	200	28,991	100%	100%	200	42,625	100%	100%

*Financial includes infrastructure and private equity funds

Note: based on the largest 200 deals by value, representing nearly 80% of total deal value in 2011

Figure 6: Operational vs technology purchases – 2010-2011

	2010				2011			
	Number	Value (US\$m)	% number	% value	Number	Value (US\$m)	% number	% value
Operational	137	20,940	75%	78%	140	27,888	64%	75%
Technology	63	8,051	25%	22%	60	14,737	36%	25%
Total	200	28,991	100%	100%	200	42,625	100%	100%

Note: based on top 200 deals by value

Chinese IPO flow

IPOs are not included in the deals analysis and totals in this report but the largest ones are listed in figure 7. The flow of Chinese renewable company IPOs continued in 2011, on the Hong Kong and Shanghai exchanges. The flow was maintained despite the market uncertainties and sovereign debt concerns that had shut down IPO prospects elsewhere. Sinohydro's US\$2.1bn IPO of 30% of its equity was the biggest in Asia in 2011 but had to be priced at the bottom of its indicative range to match lower demand. The company has extensive hydro interests but is also an infrastructure company with wide-ranging other investments besides energy.

At the beginning of the year, Sinovel Wind Group had succeeded in pricing its US\$1.4bn IPO at the top of its indicative range. Interest in photovoltaic (PV) equipment maker Beijing Jingyuntong Technology Company was strong when it listed in September 2011 despite concerns about overcapacity in the solar PV market. Towards the end of the year however, the IPO of Guodian Technology & Environment Group, whose parent company is major power plant operator China Guodian Corporation, was delayed.

The size of its raising was reduced by 50% prior to finally listing at the end of December. Guodian Technology & Environment Group is the largest environmental protection and energy conservation solutions provider for Chinese coal-fired power plants and is also actively developing and promoting windpower and solar energy in China and internationally.

Figure 7: Top five renewable energy IPOs in 2011

No.	Value of transaction (US\$m)	Date announced	Company	Country	Exchange	Market sector
1	2,114	29 Sep 11	Sinohydro Corporation Ltd.	China	Shanghai Stock Exchange	Hydro, Wind
2	1,429	05 Jan 11	Sinovel Wind Group Co. Ltd.	China	Shanghai Stock Exchange	Wind
3	878	10 Jun 11	Huaneng Renewables Corp. Ltd. (f.k.a. Huaneng New Energy Industrial)	China	Hong Kong Stock Exchange	Wind, Solar
4	648	30 Dec 11	Guodian Technology & Environment Group Corp.	China	Hong Kong Stock Exchange	Energy efficiency
5	394	09 Sep 11	Beijing Jingyuntong Technology Co. Ltd.	China	Shanghai Stock Exchange	Solar

Deal dialogue: Alternatives to bank finance

The current environment means many companies need to look at alternatives to bank finance. The big utility companies can look to traditional markets, such as the investment grade bond market. But others, particularly in the renewables sector, need to look for alternatives.

The high yield market is one traditional area for weaker issuers. But high yield market conditions in Europe have been very challenging. Alternatives include the US private placement market, where companies do not need a formal public rating, mezzanine finance and asset-based lending which has developed and moved on from its old role of being akin to 'lending of last resort'.

The pressure on European bank finance is here to stay and key challenges will not be fully resolved in the near term. Even for strong issuers, caution will prevail but waiting for market improvements is no longer a safe option. Borrowing capacity may be increased by accessing public markets, moves towards a US-style funding model and mixed maturities. Chief finance officers will need to use a combination of instruments and markets to mitigate against the risk of bank failure.

There are many areas of liquidity – in sources such as sovereign wealth funds and hedge funds – but they are spread in different places. Companies accessing such sources need to be ready to adjust to a new world of disintermediation with such funders expecting a direct interface with the company. Business cases and deal rationales need to be extremely well developed. PwC can help with this interface. We have developed a database of over 130 investors active in European debt markets. We have acted on raising 38bn euros from investors since late 2008 and 14bn euros in the last 18 months alone.

Deal places: a focus on markets worldwide

The deal focus has switched firmly back across the Atlantic compared to a year earlier when North America had rivalled Europe for deal activity. Europe accounted for 56% of target deal value in 2011 and European bidders were responsible for 48% of total worldwide deal value. Although the number of European targets dipped 6%, the total value of such targets rose 80%, from US\$16.7bn to US\$30bn.

South America was another region that saw a big increase in deal value – up from US\$3.8bn in 2010 to US\$6.2bn in 2011. The increase was accounted for by the US\$2.9bn CPFL Energias Renováveis deal (see deal review section). But the pace of dealmaking in the region was also up – deal numbers nearly doubled, albeit from a low base.

North American deal numbers and value dipped 5%, having recorded a strong rise in the previous year. Only two deals from the region made it into the top ten list compared with four in 2010. But there was a big jump in both the number and value of deals for North American solar assets. Solar targets comprised over a third (35%) of all deals and 42% of total renewables deal value in the region.

Deal numbers were down by a quarter for targets in the Asia Pacific region but the total value transacted rose 15% to US\$4.6bn. This remained well short of the US\$7.3bn of 2009. But these totals do not include the flow of Chinese renewables IPOs that have taken place (see figure 7). Values were higher on the buy side – buyers from the region purchased US\$9.4bn worldwide in 2011, nearly double the US\$4.8bn in the previous year.

Figure 8: Deals by target continent

Europe	2010	2011	% change
Value of deals (US\$m)	16,692	30,049	80%
Number of deals	293	275	(6)%
Average deal value (US\$m)	57	109	

North America	2010	2011	% change
Value of deals (US\$m)	13,045	12,397	(5)%
Number of deals	206	195	(5)%
Average deal value (US\$m)	63	64	

South America	2010	2011	% change
Value of deals (US\$m)	3,816	6,206	63%
Number of deals	20	38	90%
Average deal value (US\$m)	191	163	

Asia Pacific (incl. Australasia)	2010	2011	% change
Value of deals (US\$m)	4,017	4,612	15%
Number of deals	78	58	(26)%
Average deal value (US\$m)	51	80	

Figure 9: 2011 deals by continent by value of transactions (2011 total: US\$53,495m)
(2010 deals shown in parenthesis – 2010 total US\$38,221m)

By Target	By value (US\$m)	Number of deals	% share of total deal value	% share of total deal number
Europe	30,049 (16,692)	275 (293)	56% (44%)	48% (48%)
North America	12,397 (13,045)	195 (206)	23% (34%)	34% (34%)
Asia Pacific	4,612 (4,017)	58 (78)	9% (11%)	10% (13%)
South America	6,206 (3,816)	38 (20)	12% (10%)	7% (3%)
Middle East & Africa	231 (649)	4 (9)	0% (2%)	1% (1%)
Total	53,495 (38,221)	570 (606)	100% (100%)	100% (100%)

By Bidder	By value (US\$m)	Number of deals	% share of total deal value	% share of total deal number
Europe	25,667 (16,292)	264 (274)	48% (43%)	46% (45%)
North America	12,796 (15,975)	207 (238)	24% (42%)	36% (39%)
Asia Pacific	9,415 (4,776)	75 (81)	18% (12%)	13% (13%)
South America	5,253 (1,129)	20 (11)	10% (3%)	4% (2%)
Middle East & Africa	365 (48)	4 (2)	1% (0%)	1% (0%)
Total	53,495 (38,221)	570 (606)	100% (100%)	100% (100%)

Deal places: a focus on markets worldwide

Europe

Europe was the biggest hunting ground for renewables and cleantech deals in 2011. Six of the top ten largest deals were for European targets. The biggest deal of the year featured a Japanese buyer. The remainder of the six were all European affairs. The importance of grid modernisation and smart metering as a route to facilitating renewable generation expansion and energy efficiency was highlighted by the two largest European deals.

The biggest deal saw Japan's Toshiba win the auction for Swiss smart metering company Landis+Gyr in a US\$2.3bn deal. The company's auction by its Australian investment group owner Bayard Capital attracted bids from competing US and Swedish private equity interests before Toshiba sealed the deal. It gives Toshiba diversification into the growing worldwide smart grid market, complementing its existing presence in generation. It comes at a time when the Japanese nuclear emergency has dampened prospects in Toshiba's nuclear generation equipment market.

The US\$1.4bn acquisition of Spanish software and services company Telvent by France's Schneider Electric is another important move in the smart grid and energy management field. Schneider Electric is a global specialist in energy management with operations in more than 100 countries. Telvent's smart grid services include grid monitoring and control software and the company also has various intelligence and information technologies that complement Schneider's energy management services.

In contrast to previous years when German targets comprised a larger proportion of target value, deal value and numbers were much more evenly spread between the larger European country markets of Spain, Italy, France, Germany and the UK. The buy-backs by Iberdrola and EDF (see deal review section) boosted deal totals in Spain and France. There was also a concentration of larger deals for solar and wind assets in Spain and Italy, most notably private equity firm Bridgepoint's US\$880m purchase of 11 windfarms from Spanish construction group ACS and UK private equity firm Terra Firma's US\$933m purchase of solar PV developer Rete Rinnovabile from Italian grid operator Terna. This deal was announced in 2010 but did not complete until 2011.

Figure 10: Europe renewables deals by sector – 2011

	By value (US\$m)	% share of total Europe deal value	Number of deals	% share of total Europe deal number
Wind	11,954	40%	104	38%
Solar	9,697	32%	103	37%
Energy efficiency	5,761	19%	31	11%
Biomass	1,458	5%	24	9%
Hydro	559	2%	6	2%
Biofuels	473	2%	4	1%
Geothermal	149	0%	3	1%
Total	30,049	100%	275	100%

Elsewhere, the US\$1.1bn injection of Danish pension fund investment in Dong Energy's Anholt windfarm was a significant milestone in attracting investment into offshore wind developments (see pension and insurance interest steps up on page 8). The major expansion of European windpower is producing a flow of supply chain deals as companies compete for growth and manage their balance sheets. Germany's ZF Friedrichshafen's US\$731m purchase of Belgium-based Hansen Transmissions, which makes gearboxes for wind turbines, expanded its capacity and capabilities but also helped relieve debt from Indian wind turbine maker Suzlon Energy and Ecofin, which had owned a share of Hansen.

Away from the large deals, the first equity investment by an Asian entity in the UK wind sector saw Marubeni Corporation buy a US\$200m 49.9% stake in Dong Energy's 172MW Gunfleet Sands offshore windfarm. The project went into full production in 2010. The two companies also agreed a long-term purchase agreement for the power production and green certificates arising from Marubeni's share of the windfarm.

Figure 11: Europe renewables deals by country – 2011

	By value (US\$m)	% share of total Europe deal value
Spain	4,996	17%
Italy	4,601	15%
France	3,641	12%
Germany	3,591	12%
UK	3,224	11%
Switzerland	2,483	8%
Norway	2,338	8%
Denmark	1,342	4%
Belgium	862	3%
Poland	816	3%
Other countries	2,155	7%
Total	30,049	100%

Deal dialogue: Valuation – uncertainty continues to hinder value

Despite an increase in the number of new investors entering the renewables sector in 2011, asset valuations struggled to maintain the highs achieved in 2010 as uncertainty about government support mechanisms begin to take a toll on investor risk appetite.

Capital being deployed into the renewable sector continues to grow, albeit at a slower rate. Total investment was up in 2011 from 2010. Wind and solar continue to attract the majority of investment. 2011 saw the number of solar deals surpass wind and attract more capital for the first time. But this has not translated into an increase in valuations. Regulatory uncertainties, combined with greater power price volatility and a disjointed approach to policy, meant investors took a more cautious approach to asset valuation.

The divergence between buyer and seller price expectations and the increased cost of debt financing has held back asset values. Technology-specific idiosyncrasies also played their part in valuations:

- Recent lower than expected wind speeds in some regions have also led to buyer caution with many market participants adjusting down load factors across their wind operational assets.
- Overcapacity in the manufacture of solar equipment has driven the solar cost base down, causing governments to re-evaluate the amount of support provided to solar projects. Many European countries have imposed volume caps, reduced or suspended the applicable tariff. This has caused uncertainty for investors and raised risk premiums.

Although valuations in many of the more mature markets have declined, emerging markets such as Brazil, India, Turkey and South Africa provide new territories for investors. Competition for good quality assets will ensure valuations in these markets remain high.

Our global renewables teams have sector experts who understand the factors underpinning valuations of renewable assets. With PwC's international network, we are able to advise on the local situation within the context of a global market to assist you with your deal needs.

North America

For the first time ever, solar energy deals delivered the highest share of renewables deal value and numbers in North America. The total value of deals for solar assets in the region more than doubled, from US\$2.5bn in 2010 to US\$5.2bn in 2011. US\$1.4bn of the rise was attributable to French oil and gas major Total's purchase of SunPower Corporation. Part of the increase was the result of distress sales by some solar companies but it also reflects signs of the US solar market picking up pace and growing in significance.

Financing and market conditions have constrained the ability of solar companies to gain access to capital. The need to team up with companies with deep pockets was reflected in the largest North American deal. Total's investment in a majority stake in SunPower gives the US solar panel supplier greater financing, geographical and R&D strength. It is part of a shake-out of the sector that is likely to be dominated by a smaller number of large global players. The deal was followed by the integration of Tenesol, Total's solar unit, with SunPower. After the sale of Tenesol, Total owns about 66% of SunPower's common shares.

North American deal value was also boosted by Canadian income fund Enbridge's addition of US\$1.2bn worth of wind and solar assets into its portfolio. These include the 80MW Sarnia Solar Project in Ontario which, according to Enbridge, is the largest operating solar PV facility in the world. Another investment by Enbridge, of US\$330m for a 50% share of the 300MW Lac Alfred wind project in Quebec, remained pending at end of 2011. The attraction for funds like Enbridge in such projects is the prospect of long-term cash flows.

Figure 12: North America renewables deals by sector – 2011

	By value (US\$m)	% share of total North America deal value	Number of deals	% share of total North America deal number
Solar	5,159	42%	68	35%
Energy efficiency	3,064	25%	42	22%
Wind	2,363	19%	44	23%
Biofuels	834	7%	24	12%
Hydro	625	5%	7	4%
Biomass	320	3%	8	4%
Geothermal	33	0%	2	1%
Total	12,397	100%	195	100%

Similar motivations, together with energy mix repositioning, prompted MidAmerican Energy Holdings, the utility company owned by Warren Buffett's Berkshire Hathaway, to make its first investment in solar power. It announced in December 2011 that it will purchase the 550MW Topaz Solar Farm from First Solar. Pacific Gas and Electric Company will buy the electricity from Topaz under a 25-year power purchase agreement. The PV facility is under construction and First Solar will continue to build and operate the plant. Topaz was one of the first solar energy plants that did not qualify for financing under the US Department of Energy's loan guarantee scheme. Commenting on the deal, Greg Abel, chairman, president and CEO of MidAmerican Energy Holdings Company, said: "This project also demonstrates that solar energy is a commercially viable technology without the support of governmental loan guarantees²." No value has been disclosed and the deal remains pending so is not included in the deal totals.

² MidAmerican Energy Holdings, press release, 7 December 2011.

The SunPower deal and the First Solar deal highlight different ends of the financing needs of solar companies. In the case of the former, it is finance for overall expansion and growth of the company as a whole worldwide. First Solar is also an important global player. The MidAmerican deal highlights the sometimes 'stop start' environment for renewable energy project financing in the US. The loan guarantee scheme was always designed as a finite time-limited programme. Another part of the American stimulus package was provision for bonus depreciation.

This allowed for 100% bonus depreciation in 2011 and 50% bonus depreciation in 2012. Although the 100% bonus has not been extended at the time of writing, a 12-month extension has been proposed in a legislative bill before Congress.

Similarly, as the year came to end, there was again uncertainty over the future of the production tax credit which provides a significant tax incentive to help energy developers raise private funds to bring renewable energy projects to completion.

The growth in deals for energy efficiency and related cleantech assets has continued with US\$3.1bn of such deals in 2011, up from US\$2.5bn the previous year. But there was a falling off of windpower deals. Their share of North American deal value dropped significantly from 28% to 19% with total windpower deal value in the region falling 35%, from US\$3.6bn to US\$2.4bn.

Figure 13: North America renewables deals by country – 2011

	By value (US\$m)	% share of total North America deal value
United States	9,482	76%
Canada	2,767	22%
Mexico	148	1%
Total	12,397	100%

Deal dialogue:

Tax equity structures come back into focus in the US

With the expiration of the US federal renewable cash grant programme, the focus of renewable developers is switching back to monetising tax credits and cost recovery deductions. Finding the right structure and understanding how the transactions affect accounting and financial reporting are essential.

For the past three years, US renewable developers have been able to rely on a federal renewable grant which provided a grant in lieu of credit for 30% of qualifying construction costs for the majority of renewable projects. This reduced their need for other sources of capital, such as tax equity. But the grant programme expired at the end of 2011 putting renewed focus on the need for investors with tax appetite.

Developers need to consider complex tax equity structures and their related implications on overall project cost of capital in order to effectively compete in developing and transacting on renewable projects. These complex tax equity structures will affect earnings and cash flow as well as accounting and financial reporting.

Examples of potential structures can include:

- **flip structure:** The majority of the tax credits and cost recovery deductions (i.e. depreciation) are allocated to the investor until a preferred return is achieved, after which the majority of such allocations revert to the developer
- **sale leaseback:** The developer sells the asset to the investor in exchange for cash and leases the asset back from the investor. The investor receives the tax credits and cost recovery deductions as well as rent from the developer.

There is no one-size-fits-all model and generally financial models can differ greatly between investor and developer. It is important to understand the different structuring options available, be able to properly model the structures, and understand the impact on earnings and financial reporting.

PwC can help. Our power and utilities M&A specialists offer expert market and deal strategy advice and diligence services. We deliver value through quantitative analysis, rigorous implementation and leading edge structuring techniques, ensuring tax-efficient deal completion, appropriate financial reporting, and post-deal integration.

Deal places: a focus on markets worldwide

Asia Pacific

The majority of renewables and cleantech deal value involving Asia Pacific entities continues to be tilted towards outbound worldwide deals rather than targets inside the region. Asia Pacific targets accounted for US\$4.6bn but Asia Pacific buyers completed US\$9.4bn of transactions in 2011. Just under half of this bidder total was accounted for by the two big European purchases by Toshiba and China National Bluestar (see Europe section).

The China National Bluestar deal, which had been announced the previous year, and the more recent purchase of US solar company SunPower by Total highlight the trend towards global consolidation and growth in solar. But at the domestic level within China the solar sector remains highly fragmented across small producers and is in considerable need of consolidation. The same is the case in the windpower sector. China's Five Year Plan 2011-16 stresses that the government will back efficient providers and pressure inefficient providers to leave the market³. Reuters reports a draft proposal from China's Ministry of Industries and Information Technology (MIIT) envisaging the creation of one or two big solar makers and about eight to ten medium-sized ones⁴.

Japanese and Chinese buyers have led expansionist renewables deal activity but the scope for companies from other countries, such as Korea and Singapore, was highlighted in some smaller deals. South Korean conglomerates Hanwa Chemical Corporation and SK Group featured in moves to invest in China's SolarFun Power Holdings and US thin film solar PV manufacturer HelioVolt respectively.

The largest deal for assets within the region was Universal Development Resources US\$1.7bn purchase of a 25.5% stake in True Green Energy Group, a Frankfurt listed clean energy group headquartered and operational in the Philippines. Universal Development Resources represents the interests of several prospective construction companies and multi-billion dollar firms in China, including but not limited to CITIC Group, China State Engineering Construction Corporation, and China Railroad Engineering Construction Corporation. True Green Energy Group is developing low cost housing infrastructure which includes decarbonised electric power generation through biomass from waste energy.

³ Government of China, 12th Five-Year Plan, March 2011.

⁴ Reuters, Analysis: Solar companies to seek deep pockets in downturn, 6 December 2011.

Figure 14: Asia Pacific renewables deals by sector – 2011

	By value (US\$m)	% share of total Asia Pacific deal value	Number of deals	% share of total Asia Pacific deal number
Biomass	1,971	43%	11	19%
Wind	980	21%	15	26%
Solar	899	19%	16	28%
Energy efficiency	373	8%	7	12%
Hydro	193	4%	2	3%
Geothermal	101	2%	3	5%
Biofuels	94	2%	4	7%
Total	4,612	100%	58	100%

The remainder of deals in the region were for much smaller values. They were headed by a US\$262m sale by Tokyo Electric Power Company (Tepco) of an additional stake in renewables company Eurus Energy Holdings Corporation to Toyota Tsusho. Toyota Tsusho was already a partner in the joint venture between the companies and the sale came in the wake of the Fukushima emergency and the subsequent need for fundraising by Tepco.

In Australia, the largest completed deal was natural gas infrastructure company APA Group's US\$180m purchase of the 80MW Emu Downs windfarm in Western Australia and development rights for an adjacent 130MW development site. The Emu Downs sale was followed closely by AGL Energy's US\$171m sale of the nearly completed 67MW Oaklands Hill windfarm in Victoria to Challenger Group. At the end of the year, Guohua, a unit of China's state-owned coal giant Shenhua Group, was announced on 22 December as the successful bidder for a 75% interest in Hydro Tasmania's Woolnorth Wind Farms (140MW), following a hotly contested bidding process.

This transaction continues a trend of increasing interest from Chinese investors in the Australian wind sector. During 2011, China Datang Renewable Energy teamed up with Australian project developer CBD Energy in a joint venture with the stated ambition of gaining a third of the Australian wind market over the next eight years. The Chinese wind turbine manufacturer, Goldwind, has recently invested in two wind development projects with the intention of selling these projects to longer-term investors over time.

Weak wholesale electricity and renewable energy certificate (REC) prices has hampered new renewable energy construction in Australia. However, a handful of new projects received power purchase agreements (PPAs) from retailers in 2011. These included projects from Acciona of Spain and Chinese investors (see above). Some commentators also saw the price received by AGL on its developed assets (under construction) as signalling better prospects for renewable energy growth. While the major retailers still hold excess RECs on their balance sheets, they have been prepared to contract at favourable prices, and may also be recognising that the REC supply/demand balance could quickly change if sufficient new projects are not brought online on a timely basis in the period to 2020, by which time 20% of their energy supply must be from renewable sources.

Wholesale electricity prices are also showing signs of lifting. In the near term this will mainly be driven by explicit carbon pricing affecting the cost of production for the fossil-fuel based generators, which typically determines prices in the market. Towards the end of 2011 the federal government passed its long-debated carbon legislation. The new law sets a fixed carbon tax of A\$23 per tonne on the 500 highest emitters from July 2012. The price will increase by 2.5% per annum for the first three years, after which it will be determined by an emissions trading scheme (from July 2015). The clean energy legislation also included the Contract for Closure (CFC) programme, which seeks to negotiate the closure of around 2,000MW of highly emissions-intensive coal-fired generation capacity by 2020. Specific criteria have been published, with brown coal-fired power stations in Victoria and South Australia heading the list of applicable plants for closure under the programme. This is expected to lead a significant change in the generation mix, as coal gives way to gas or renewables as a fuel source for new greenfield investment. It could also potentially lead to deal activity where owners of affected plant consider their options as to their ongoing competitive position in the market.

Figure 15: Asia Pacific renewables deals by country – 2011

	By value (US\$m)	% share of total Asia Pacific deal value
Philippines	1,716	37%
China	982	21%
Australia	683	15%
Japan	579	13%
India	357	8%
Taiwan	176	4%
Malaysia	58	1%
New Zealand	42	1%
Korea	17	<1%
Thailand	3	<1%
Total	4,612	100%

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